

ANSWER 4 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
DUPLICATE 2

ACCESSION NUMBER: 2003:287568 BIOSIS
DOCUMENT NUMBER: PREV200300287568
TITLE: The synergistic activation of **FLOWERING LOCUS C**
by **FRIGIDA** and a new **flowering** gene
AERIAL ROSETTE 1 underlies a novel morphology in
Arabidopsis.
AUTHOR(S): Poduska, Branislava; Humphrey, Tania; Redweik, Antje;
Grbic, Vojislava (1)
CORPORATE SOURCE: (1) Department of Plant Sciences, University of Western
Ontario, London, ON, N6A 5B7, Canada: vgrbic@uwo.ca Canada
SOURCE: Genetics, (April 2003, 2003) Vol. 163, No. 4, pp.
1457-1465. print.
ISSN: 0016-6731.
DOCUMENT TYPE: Article
LANGUAGE: English

AB The genetic changes underlying the diversification of plant forms
represent a key question in understanding plant macroevolution. To
understand the mechanisms leading to novel plant morphologies we
investigated the Sy-0 ecotype of Arabidopsis that forms an enlarged basal
rosette of leaves, develops aerial rosettes in the axils of cauline
leaves, and exhibits inflorescence and floral reversion. Here we show that
this heterochronic shift in reproductive development of all shoot
meristems requires interaction between dominant alleles at AERIAL ROSETTE
1 (ART1), **FRIGIDA** (FRI), and **FLOWERING LOCUS**
C (FLC) loci. ART1 is a new **flowering** gene that maps 14 cM
proximal to FLC on chromosome V. ART1 activates FLC expression through a
novel **flowering** pathway that is independent of **FRI** and
independent of the autonomous and vernalization pathways. Synergistic
activation of the floral repressor FLC by ART1 and **FRI** is
required for delayed onset of reproductive development of all shoot
meristems, leading to the Sy-0 phenotype. These results demonstrate that
modulation in **flowering**-time genes is one of the mechanisms
leading to morphological novelties.

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DUPLICATE 4

ACCESSION NUMBER: 2003:352090 BIOSIS
DOCUMENT NUMBER: PREV200300352090
TITLE: Analysis of the molecular basis of **flowering** time
variation in Arabidopsis accessions.
AUTHOR(S): Gazzani, Silvia; Gendall, Anthony R.; Lister, Clare; Dean,
Caroline (1)
CORPORATE SOURCE: (1) Department of Cell and Developmental Biology, John
Innes Centre, Colney Lane, Norwich, NR4 7UH, UK:
caroline.dean@bbsrc.ac.uk UK
SOURCE: Plant Physiology (Rockville), (June 2003, 2003) Vol. 132,
No. 2, pp. 1107-1114. print.
ISSN: 0032-0889.
DOCUMENT TYPE: Article
LANGUAGE: English

AB Allelic variation at the **FRI** (**FRIGIDA**) and FLC (**FLOWERING LOCUS C**) loci are major determinants of
flowering time in Arabidopsis accessions. Dominant alleles of
FRI confer a vernalization requirement causing plants to
overwinter vegetatively. Many early **flowering** accessions carry
loss-of-function **fri** alleles containing one of two deletions.
However, some accessions categorized as early **flowering** types do
not carry these deletion alleles. We have analyzed the molecular basis of
earliness in five of these accessions: Cvi, Shakh dara, Wil-2, Kondara, and
Kz-9. The Cvi **FRI** allele carries a number of nucleotide
differences, one of which causes an in-frame stop codon in the first exon.
The other four accessions contain nucleotide differences that only result

in amino acid substitutions. Preliminary genetic analysis was consistent with Cvi carrying a nonfunctional **FRI** allele; Wil-2 carrying either a defective **FRI** or a dominant suppressor of **FRI** function; and Shakh dara, Kondara, and Kz-9 carrying a functional **FRI** allele with earliness being caused by allelic variation at other loci including FLC. Allelic variation at FLC was also investigated in a range of accessions. A novel nonautonomous Mutator-like transposon was found in the weak FLC allele in Landsberg erecta, positioned in the first intron, a region required for normal FLC regulation. This transposon was not present in FLC alleles of most other accessions including Shakh dara, Kondara, or Kz-9. Thus, variation in Arabidopsis **flowering** time has arisen through the generation of nonfunctional or weak **FRI** and FLC alleles.

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DUPLICATE 7

ACCESSION NUMBER: 2002:522944 BIOSIS
DOCUMENT NUMBER: PREV200200522944
TITLE: DNA polymorphism at the **FRIGIDA** gene in Arabidopsis thaliana: Extensive nonsynonymous variation is consistent with local selection for **flowering** time.
AUTHOR(S): Le Corre, Valerie (1); Roux, Fabrice; Reboud, Xavier
CORPORATE SOURCE: (1) Laboratoire Malherbologie et Agronomie, INRA, 21065, BP 86510, Dijon Cedex: lecorre@dijon.inra.fr France
SOURCE: Molecular Biology and Evolution, (August, 2002) Vol. 19, No. 8, pp. 1261-1271. <http://www.molbioevol.org/>. print. ISSN: 0737-4038.
DOCUMENT TYPE: Article
LANGUAGE: English

AB **FRIGIDA** (**FRI**) is a major gene involved in the regulation of **flowering** time in Arabidopsis thaliana. Nucleotide variation at this gene was investigated by sequencing 25 field ecotypes collected from western Europe. Genetic diversity at **FRI** was characterized by a high number of haplotypes and an excess of low-frequency polymorphisms. A large excess of intraspecific nonsynonymous variation associated with low synonymous variation was detected along the first exon in the **FRI** gene. In contrast, no excess of nonsynonymous divergence was detected between A. thaliana and A. lyrata. The Tajima and McDonald and Kreitman tests, however, suggested that this gene has evolved in a nonneutral fashion. Nonsynonymous variation included eight loss-of-function mutations that have probably arisen recently and independently in several locations. A phenotypic evaluation of the sequenced ecotypes confirmed that these loss-of-function mutations were associated with an early-**flowering** phenotype. Taken together, our results suggest that DNA polymorphism at the **FRI** gene in A. thaliana from western Europe has been shaped by recent positive selection for earliness in a set of isolated populations.

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ACCESSION NUMBER: 2002:64184 AGRICOLA
DOCUMENT NUMBER: IND23293348
TITLE: Sequence variation and haplotype structure surrounding the **flowering** time locus **FRI** in Arabidopsis thaliana.
AUTHOR(S): Hagenblad, J.; Nordborg, M.
AVAILABILITY: DNAL (442.8 G28)
SOURCE: Genetics, May 2002. Vol. 161, No. 1. p. 289-298
Publisher: Bethesda, Md. : Genetics Society of America.
CODEN: GENTAE; ISSN: 0016-6731

NOTE: Includes references
PUB. COUNTRY: Maryland; United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

L5 ANSWER 19 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
ACCESSION NUMBER: 2002:610423 BIOSIS
DOCUMENT NUMBER: PREV200200610423
TITLE: Direct determination of single nucleotide polymorphisms in
FRIGIDA utilizing the adenine DNA glycosylase MutY.
AUTHOR(S): Sanda, Sherrie L. (1); Samols, Sui Bi A. (1); Holecek,
James J. (1); Post, Marc A. (1); Moffett, R. B. (1)
CORPORATE SOURCE: (1) USB Corporation, Cleveland, OH: ssanda@usbweb.com USA
SOURCE: Plant Biology (Rockville), (2002) Vol. 2002, pp. 183-184.
http://www.aspb.org/meetings/. print.
Meeting Info.: Annual Meeting of the American Society of
Plant Biologists on Plant Biology Denver, CO, USA August
03-07, 2002 American Society of Plant Biologists

DOCUMENT TYPE: Conference
LANGUAGE: English

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(2003) on STN DUPLICATE 12

ACCESSION NUMBER: 2001:64492 AGRICOLA
DOCUMENT NUMBER: IND23223506
TITLE: Loss of **FLOWERING** LOCUS C activity
eliminates the late-flowering phenotype of
FRIGIDA and autonomous pathway mutations but
not responsiveness to vernalization.
AUTHOR(S): Michaels, S.D.; Armasino, R.M.
AVAILABILITY: DNAL (QK725.P532)
SOURCE: The Plant cell, Apr 2001. Vol. 13, No. 4. p. 935-941
Publisher: [Rockville, MD : American Society of Plant
Physiologists, c1989-
CODEN: PLCEEW; ISSN: 1040-4651

NOTE: Includes references
PUB. COUNTRY: Maryland; United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB The MADS domain-containing transcription factor **FLOWERING** LOCUS
C (FLC) acts as an inhibitor of **flowering** and is a convergence
point for several pathways that regulate **flowering** time in
Arabidopsis. In naturally occurring late-flowering ecotypes, the
FRIGIDA (**FRI**) gene acts to increase FLC levels, whereas
the autonomous floral promotion pathway and vernalization act to reduce
FLC expression. Previous work has shown that the Landsberg erecta allele
of FLC, which is not a null allele, is able to partially suppress the
late-flowering phenotype of **FRIGIDA** and mutations in
the autonomous pathway. In this study, using a null allele of FLC, we show
that the late-flowering phenotype of **FRIGIDA** and
autonomous pathway mutants are eliminated in the absence of FLC activity.
In addition, we have found that the downregulation of SUPPRESSOR OF
OVEREXPRESSION OF CONSTANS1 by **FRI** and autonomous pathway
mutants also is mediated by FLC. Complete loss of FLC function, however,
does not eliminate the effect of vernalization. Thus, **FRI** and
the autonomous pathway may act solely to regulate FLC expression, whereas
vernalization is able to promote **flowering** via FLC-dependent and
FLC-independent mechanisms.

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- L5 ANSWER 1 OF 65 CAPLUS COPYRIGHT 2003 ACS on STN
TI Plant genes involved in flower development and timing of flower formation and their use in plant breeding
- L5 ANSWER 2 OF 65 CAPLUS COPYRIGHT 2003 ACS on STN
TI Autoregulation of FCA pre-mRNA processing controls Arabidopsis **flowering** time
- L5 ANSWER 3 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
DUPLICATE 1
TI PIE1, an ISWI family gene, is required for FLC activation and floral repression in Arabidopsis.
- L5 ANSWER 4 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
DUPLICATE 2
TI The synergistic activation of **FLOWERING** LOCUS C by **FRIGIDA** and a new **flowering** gene AERIAL ROSETTE 1 underlies a novel morphology in Arabidopsis.
- L5 ANSWER 5 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 3
TI Genetics of drought adaptation in Arabidopsis thaliana: I. Pleiotropy contributes to genetic correlations among ecological traits
Special issue: Genes in ecology.
- L5 ANSWER 6 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
DUPLICATE 4
TI Analysis of the molecular basis of **flowering** time variation in Arabidopsis accessions.
- L5 ANSWER 7 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 5
TI AGL24 acts as a promoter of **flowering** in Arabidopsis and is positively regulated by vernalization.
- L5 ANSWER 8 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
TI Vernalization: The flower school.
- L5 ANSWER 9 OF 65 CAPLUS COPYRIGHT 2003 ACS on STN
TI Floral induction gene FPA isolated from Arabidopsis thaliana and use thereof
- L5 ANSWER 10 OF 65 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) on STN DUPLICATE 6
TI Birdsfoot trefoil **flowering** response to photoperiod length.
- L5 ANSWER 11 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
DUPLICATE 7
TI DNA polymorphism at the **FRIGIDA** gene in Arabidopsis thaliana: Extensive nonsynonymous variation is consistent with local selection for **flowering** time.
- L5 ANSWER 12 OF 65 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) on STN DUPLICATE 8
TI Bay-0 x Shahdara recombinant inbred line population: a powerful tool for the genetic dissection of complex traits in Arabidopsis.
- L5 ANSWER 13 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 9
TI The VERNALIZATION INDEPENDENCE 4 gene encodes a novel regulator of **FLOWERING** LOCUS C.

L5 ANSWER 14 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
TI Activation of FLC by ART1, ART2 and **FRI** is required for the
altered body plan of the Sy-0 ecotype of Arabidopsis.

L5 ANSWER 15 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
TI Analysis of Limburg, an Arabidopsis late-**flowering** aerial
rosette-bearing ecotype.

=> d 16-30 ti

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TI Sequence variation and haplotype structure surrounding the
flowering time locus **FRI** in Arabidopsis thaliana.

L5 ANSWER 17 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 11
TI Effects of simulated grazing on growth and persistence of Artemisia
frigida in a semiarid sandy rangeland.

L5 ANSWER 18 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
TI Genetics of drought adaptation in Arabidopsis thaliana: Natural variation,
QTL mapping, near-isogenic lines and transformants.

L5 ANSWER 19 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
TI Direct determination of single nucleotide polymorphisms in **FRIGIDA**
utilizing the adenine DNA glycosylase MutY.

L5 ANSWER 20 OF 65 CAPLUS COPYRIGHT 2003 ACS on STN
TI Epigenetics: The flowers that come in from the cold

L5 ANSWER 21 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
TI The VERNALIZATION INDEPENDENCE4 gene encodes a novel regulator of
FLOWERING LOCUS C.

L5 ANSWER 22 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN
TI Function and regulation of the vernalization-responsive gene EARLI1.

L5 ANSWER 23 OF 65 CABA COPYRIGHT 2003 CABI on STN
TI Effect of grazing on reproduction in Potentilla acaulis population.

L5 ANSWER 24 OF 65 AGRICOLA Compiled and distributed by the National
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(2003) on STN
TI The vernalization response of Arabidopsis.

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Agricultural Library of the Department of Agriculture of the United States
of America. It contains copyrighted materials. All rights reserved.
(2003) on STN DUPLICATE 12
TI Loss of **FLOWERING** LOCUS C activity eliminates the late-
flowering phenotype of **FRIGIDA** and autonomous pathway
mutations but not responsiveness to vernalization.

L5 ANSWER 26 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 13
TI RNA levels and activity of **FLOWERING** LOCUS C are modified in
mixed genetic backgrounds of Arabidopsis thaliana.

L5 ANSWER 27 OF 65 CAPLUS COPYRIGHT 2003 ACS on STN
TI Protein and DNA sequences of a novel Arabidopsis gene VRN2 from

FRIGIDA (FRI) locus and the uses thereof in controlling
plant **flowering** time

- L5 ANSWER 28 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 14
TI The AGAMOUS-LIKE 20 MADS domain protein integrates floral inductive
pathways in Arabidopsis.
- L5 ANSWER 29 OF 65 AGRICOLA Compiled and distributed by the National
Agricultural Library of the Department of Agriculture of the United States
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(2003) on STN DUPLICATE 15
TI Molecular analysis of **FRIGIDA**, a major determinant of natural
variation in Arabidopsis **flowering** time.
- L5 ANSWER 30 OF 65 CAPLUS COPYRIGHT 2003 ACS on STN
TI Molecular analysis of **flowering** time and vernalization response
in Arabidopsis, a minireview

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TI **FLOWERING** LOCUS C encodes a novel MADS domain protein that acts as a repressor of **flowering**.

L5 ANSWER 32 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 17

TI Genetic analysis of **flowering** time for eight natural populations of *Arabidopsis thaliana* (Brassicaceae) in Japan with special regard to the genes, **FRI** and **FLC**.

L5 ANSWER 33 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 18

TI Methylation controls the low temperature induction of **flowering** in *Arabidopsis*.

L5 ANSWER 34 OF 65 CABA COPYRIGHT 2003 CABI on STN DUPLICATE 19

TI Comparison of **flowering** time genes in *Brassica rapa*, *B. napus* and *Arabidopsis thaliana*.

L5 ANSWER 35 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN

TI Plant development: Timing when to flower.

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TI Seed production, seed rain, and the seedbank of fringed sagebrush.

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TI Analysis of **flowering** time in ecotypes of *Arabidopsis thaliana*.

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TI Dissertationes Botanicae, Vol. 271 Comparison of cushion plant vegetation in high mountain areas of central and northern Europe with regard to **flowering** ecology.

L5 ANSWER 39 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN DUPLICATE 22

TI An altered body plan is conferred on *Arabidopsis* plants carrying dominant alleles of two genes.

L5 ANSWER 40 OF 65 CAPLUS COPYRIGHT 2003 ACS on STN

TI Analysis of the molecular basis of vernalization in *Arabidopsis thaliana*

L5 ANSWER 41 OF 65 CAPLUS COPYRIGHT 2003 ACS on STN

TI Molecular genetic analysis of **flowering** time in *Arabidopsis*

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TI Interaction of **FLC** and late-**flowering** mutations in *Arabidopsis thaliana*.

L5 ANSWER 43 OF 65 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN

TI Map-based cloning of the *Arabidopsis thaliana* **flowering** time locus **FRI**.

L5 ANSWER 44 OF 65 CABA COPYRIGHT 2003 CABI on STN

TI [Covering materials to control plant growth by modifying the spectral

balance of daylight].

Materiaux de couverture controlant la croissance des vegetaux par
modification de l'equilibre spectral de la lumiere du jour.

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(2003) on STN DUPLICATE 24
- TI QTL analysis of **flowering** time in Arabidopsis thaliana.

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(FILE 'HOME' ENTERED AT 16:25:08 ON 19 AUG 2003)

FILE 'AGRICOLA, CABA, BIOSIS, CAPLUS' ENTERED AT 16:25:43 ON 19 AUG 2003

- L1 881 S FRI
L2 133205 S FLOWERING
L3 1895 S (FRIGIDA OR FRI)
L4 127 S L3 AND L2
L5 65 DUP REM L4 (62 DUPLICATES REMOVED)

WEST**Freeform Search****Database:**

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| <u>L9</u> | 14 and L8 | 7 | <u>L9</u> |
| <u>L8</u> | flowering | 13169 | <u>L8</u> |
| <u>L7</u> | 14 and L6 | 3 | <u>L7</u> |
| <u>L6</u> | Dean.in. | 13979 | <u>L6</u> |
| <u>L5</u> | L4 and l3 | 1 | <u>L5</u> |
| <u>L4</u> | FRI | 1565 | <u>L4</u> |
| <u>L3</u> | west.in. | 4964 | <u>L3</u> |
| <u>L2</u> | FRI and L1 | 1 | <u>L2</u> |
| <u>L1</u> | johanson.in. | 517 | <u>L1</u> |

END OF SEARCH HISTORY